

Applicant: Pekka Koivukunnas et al.
Application No.: 10/069,203
Art Unit: 1731

Claim Listing

1-6. (cancelled)

7. (currently amended) A method for surface treatment of a paper and/or board web in a paper or board machine including a yankee cylinder having a smooth surface followed by a calendering unit, comprising the steps of:
pressing a paper or board web with a moisture of 50% to 80% with a press roll on to
the smooth surface of the yankee cylinder;
drying and glazing the web on the smooth surface of the yankee cylinder, the paper or
board web forming a gloss surface in contact with the smooth surface of the
yankee cylinder;
separating the paper or board web from the yankee cylinder with a doctor device;
following separating with the doctor device, guiding the paper or board web
immediately into a shoe calender unit having a shoe press within a flexible
mantle, and forming a nip with a roll having a rigid mantle made of metal,
wherein the gloss surface of the paper or board web is further glazed in contact
with the rigid mantle made of metal wherein the web is glazed and dried first
by means of the yankee cylinder, after which the web is immediately
calendered by means of a shoe or extended-nip calendering unit.

8. (original) The method of claim 7 wherein when it is intended to achieve a given paper or board quality, the difference between the running speed used and the maximum running speed dependent on the evaporation capacity of the yankee cylinder is compensated for by means of calendering, the calendering after the yankee cylinder enabling the running speed of the yankee cylinder to be increased without the quality in the form of the gloss and smoothness of the paper or board suffering.

9. (canceled)

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10. (currently amended) An arrangement for surface treatment of paper and/or board in a paper or board machine including a yankee cylinder followed by a calendering unit comprising:

a paper or board web with a moisture of 50% to 80% wrapped on to wherein the arrangement is formed of a combination in which there is disposed in the machine direction first a yankee cylinder having a smooth drying surface, so that a first surface of the paper or board web is engaged with the smooth drying surface of the yankee cylinder;

following the yankee cylinder the paper or board web is engaged with a doctor device and then a calendering unit, which is formed by a shoe calender unit having a shoe press within a flexible mantle, and forming a nip with a roll having a rigid mantle made of metal, wherein the first surface of the paper or board web is further glazed in contact with the rigid mantle made of metal or extended-nip calendering unit.

11. (original) The arrangement of claim 10, wherein, when it is intended to achieve a given paper or board quality, the difference between the running speed used and the maximum running speed dependent on the evaporation capacity of the yankee cylinder is compensated for by the calendering unit, wherein the calendering unit placed after the yankee cylinder enables the running speed to be increased without the quality of the paper or board suffering in the form of reduced gloss and smoothness of the paper or board.

12. (canceled)

13. (canceled)

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14. (currently amended) A method for surface treatment of a paper and/or board web in a paper or board machine comprising the steps of:
pressing a paper or board web with a moisture of 50% to 80% with a press roll on to the smooth surface of a yankee cylinder;
drying and glazing the web on the smooth surface of the yankee cylinder, the paper or board web forming a gloss surface in contact with the smooth surface of the yankee cylinder;
running [[a]] the yankee cylinder at a first running speed which is the maximum speed to obtain a given quality of web gloss and smoothness;
increasing the running speed of the yankee cylinder beyond the first running speed to produce a web having a quality of web gloss and smoothness which is below the given quality; [[and]]
separating the paper or board web from the yankee cylinder with a doctor device;
following separating with the doctor device, guiding the paper or board web immediately into a shoe calender unit having a shoe press within a flexible mantle, and forming a nip with a roll having a rigid mantle made of metal, wherein the gloss surface of the paper or board web is further glazed in contact with the rigid mantle made of metal ~~immediately calendering the web which~~ exits the yankee cylinder through a shoe or extended-nip calendering unit to impart the given quality of web gloss and smoothness to the web.

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15. (new) A method for surface treatment of a paper and/or board web in a paper or board machine including a yankee cylinder having a smooth surface followed by a calendering unit, comprising the steps of:

pressing a paper or board web with a moisture of 50% to 80% with a press roll on to the smooth surface of the yankee cylinder;

drying and glazing the web on the smooth surface of the yankee cylinder, the paper or board web forming a gloss surface in contact with the smooth surface of the yankee cylinder;

separating the paper or board web from the yankee cylinder with a doctor device; and following separating with the doctor device guiding the paper or board web

immediately into a belt technology calender unit having a roll within a flexible mantle and forming a nip with a roll having a rigid mantle made of metal, wherein the gloss surface of the paper or board web is further glazed in contact with the rigid mantle made of metal.

16. (new) The method of claim 15 wherein when it is intended to achieve a given paper or board quality, the difference between the running speed used and the maximum running speed dependent on the evaporation capacity of the yankee cylinder is compensated for by means of calendering, the calendering after the yankee cylinder enabling the running speed of the yankee cylinder to be increased without the quality in the form of the gloss and smoothness of the paper or board suffering.

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17. (new) An arrangement for surface treatment of paper and/or board in a paper or board machine including a yankee cylinder followed by a calendering unit comprising:
a paper or board web with a moisture of 50% to 80% wrapped on to a yankee cylinder having a smooth drying surface, so that a first surface of the paper or board web is engaged with the smooth drying surface of the yankee cylinder;
following the yankee cylinder the paper or board web is engaged with a doctor device and and following the doctor device the paper or board web extends through a belt technology calender unit, the belt technology having a roll within a flexible mantle and forming a nip with a roll having a rigid mantle made of metal, wherein the first surface of the paper or board web is in contact with the rigid mantle made of metal.

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18. (new) A method for surface treatment of a paper and/or board web in a paper or board machine comprising the steps of:

pressing a paper or board web with a moisture of 50% to 80% with a press roll on to the smooth surface of a yankee cylinder;

drying and glazing the web on the smooth surface of the yankee cylinder, the paper or board web forming a gloss surface in contact with the smooth surface of the yankee cylinder;

running the yankee cylinder at a first running speed which is the maximum speed to obtain a given quality of web gloss and smoothness;

increasing the running speed of the yankee cylinder beyond the first running speed to produce a web having a quality of web gloss and smoothness which is below the given quality;

separating the paper or board web from the yankee cylinder with a doctor device; and following separating with the doctor device, guiding the paper or board web immediately into a belt technology calender unit having a roll within a flexible mantle and forming a nip with a roll having a rigid mantle made of metal, wherein the gloss surface of the paper or board web is further glazed in contact with the rigid mantle made of metal to impart the given quality of web gloss and smoothness to the web.

19. (new) The method of claim 7 wherein the nip pressure is at least 200 kN/m and the Hunter gloss of the gloss surface is at least 30% after the shoe calender unit.

20. (new) The method of claim 14 wherein the nip pressure is at least 200 kN/m and the Hunter gloss of the gloss surface is at least 30% after the shoe calender unit.